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Proposed Maximum Residue Limit PMRL2015-40

Bifenthrin

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Under the authority of the *Pest Control Products Act*, Health Canada's Pest Management Regulatory Agency (PMRA) has granted conditional registration to technical grade bifenthrin and the end-use product Capture 240 EC for use in Canada on raspberries and potatoes. The specific uses approved in Canada are detailed on the product label of Capture 240 EC, *Pest Control Products Act* Registration Number 31396.

The evaluation of this bifenthrin application indicated that the end-use product has value and the human health and environmental risks associated with the new uses are acceptable.

Before registering a pesticide for food use in Canada, the PMRA must determine the quantity of residues that are likely to remain in or on the food when the pesticide is used according to label directions and that such residues will not be a concern to human health. This quantity is then legally established as a maximum residue limit (MRL). An MRL applies to the identified raw agricultural food commodity as well as to any processed food product that contains it, except where separate MRLs are specified for the raw agricultural commodity and a processed product made from it.

In addition, the PMRA is proposing to establish MRLs for bifenthrin on various commodities to permit the import and sale of food containing such residues. The PMRA has determined the quantity of residues that are likely to remain in or on the imported commodities when bifenthrin is used according to label directions in the exporting country, and that such residues will not be a concern to human health.

Consultation on the proposed MRLs for bifenthrin is being conducted via this document (see Next Steps, the last section of this document). A summary of the field trial data used to support the proposed MRLs can be found in Appendix I.

To comply with Canada's international trade obligations, consultation on the proposed MRLs is also being conducted internationally by notifying the World Trade Organization, as coordinated by the Canada's Notification Authority and Enquiry Point.

The proposed MRLs for bifenthrin are as follows.

Table 1 Proposed Maximum Residue Limits for Bifenthrin

Common Name	Residue Definition	MRL (ppm)[1]	Food Commodity
Bifenthrin	(2-methyl[1,1′-biphenyl]-3-yl)methyl (1*R*,3*R*)-*rel*-3-[(1*Z*)-2-chloro-3,3,3-trifluoro-1-propen-1-yl]-2,2-dimethylcyclopropanecarboxylate	30	Tea (dried leaves)
		7.0	Cabbages
		4.0	*Brassica* leafy greens (Crop Subgroup 4-13B); head lettuce
		3.0	Leaf petioles vegetables (Crop Subgroup 22B)

Common Name	Residue Definition	MRL (ppm)[1]	Food Commodity
		1.5	Mayhaws
		1.0	Caneberry (Crop Subgroup 13-07A)
		0.9	*Brassica* head and stem vegetables (Crop Group 5-13; except cabbage); pears
		0.8	Edible-podded legume vegetables (Crop Subgroup 6A)
		0.5	Cucurbit vegetables (Crop Group 9); fruiting vegetables (Crop Group 8-09); garden beet roots
		0.3	Spinach
		0.2	Dry soybeans
		0.15	Dried shelled pea and bean (except dry soybean) (Crop Subgroup 6C)
		0.1	Fat of cattle, goats, hogs, horses and sheep
		0.05	Succulent shelled pea and bean (Crop Subgroup 6B); tuberous and corm vegetables (Crop Subgroup 1C), carrot roots; fat and meat byproducts of poultry; meat and meat byproducts of cattle, goats, hogs, horses and sheep
		0.02	Meat of poultry; milk
		0.01	Eggs

[1] ppm = parts per million

MRLs are proposed for each commodity included in the listed crop groupings in accordance with the Residue Chemistry Crop Groups webpage in the Pesticides and Pest Management section of Health Canada's website.

MRLs established in Canada may be found using the Maximum Residue Limit Database on the Maximum Residue Limits for Pesticides webpage. The database allows users to search for established MRLs, regulated under the *Pest Control Products Act*, both for pesticides or for food commodities.

International Situation and Trade Implications

MRLs may vary from one country to another for a number of reasons, including differences in pesticide use patterns and the locations of the crop field trials used to generate residue chemistry data. For livestock commodities, differences in MRLs can also be due to different livestock feed items and practices.

Table 2 compares the MRLs proposed for bifenthrin in Canada with corresponding American tolerances and Codex MRLs.[1] American tolerances are listed in the Electronic Code of Federal Regulations, 40 CFR Part 180, by pesticide. A listing of established Codex MRLs is available on the Codex Alimentarius Pesticide Residues in Food website, by pesticide or commodity.

Once established, the American tolerances for bifenthrin will be listed in the Electronic Code of Federal Regulations, 40 CFR Part 180, by pesticide.

Table 2 Comparison of Canadian MRLs, American Tolerances and Codex MRLs (where different)

Food Commodity	Canadian MRL (ppm)	American Tolerance (ppm)	Codex MRL (ppm)
Cabbage	7.0	4.0	0.4 (Brassica (cole or cabbage) vegetables, head cabbage, flowerhead Brassicas)
Brassica leafy greens (Crop Subgroup 4-13B)	4.0	3.5 (Crop Subgroup 5B)	4 (mustard greens)
Head lettuce	4.0	3.0	None
Leaf petioles vegetables (Crop Subgroup 22B)	3.0	3.0 (Crop Subgroup 4B)	None
Mayhaws	1.5	1.4	None
Caneberry (Crop Subgroup 13-07A)	1.0	1.0 (Crop Subgroup 13A)	1 (raspberries, blackberries)

[1] The Codex Alimentarius Commission is an international organization under the auspices of the United Nations that develops international food standards, including MRLs.

Food Commodity	Canadian MRL (ppm)	American Tolerance (ppm)	Codex MRL (ppm)
Brassica head and stem vegetables (CG 5-13; except cabbage)	0.9	0.6 (Crop Subgroup 5A; except cabbage)	0.4 (Brassica (cole or cabbage) vegetables, head cabbage, flowerhead Brassicas)
Pears	0.9	0.5	None
Edible-podded legume vegetables (Crop Subgroup 6A)	0.8	0.6	None
Cucurbit vegetables (Crop Group 9)	0.5	0.4	None
Fruiting vegetables (Crop Group 8-09)	0.5	0.15 (tomato) 0.5 (groundcherry) 0.5 (pepino, pepper (bell & non-bell), okra) 0.05 (eggplant)	0.3 (tomato) 0.5 (peppers) 5 (peppers, chili, dried) 0.3 (eggplant)
Garden beet roots	0.5	0.45	0.05 (root and tuber vegetables)
Spinach	0.3	0.2	None
Dry soybeans	0.2	0.2 (soybean seed) 0.3 (soybean refined oil)	0.3 (pulses)
Dried shelled pea and bean (except dry soybean) (Crop Subgroup 6C)	0.15	0.15	0.3 (pulses)
Fat of cattle, goats, hogs, horses and sheep	0.1	1.0	None
Carrot roots	0.05	0.10 (Crop Subgroup 1B; except sugar beet and garden beet)	0.05 (root and tuber vegetables)

Food Commodity	Canadian MRL (ppm)	American Tolerance (ppm)	Codex MRL (ppm)
Fat of poultry	0.05	0.05	None
Meat of cattle, goats, hogs, horses and sheep	0.05	0.5	3 (meat (from mammals other than marine mammals)
Meat byproducts of cattle, goats, hogs, horses, poultry and sheep	0.05	0.1	0.2 (edible offal (mammalian))
Succulent shelled pea and bean (Crop Subgroup 6B)	0.05	0.05	None
Tuberous and corm vegetables (Crop Subgroup 1C)	0.05	0.05	0.05 (root and tuber vegetables)
Meat of poultry	0.02	0.05	None
Milk	0.02	0.1	0.2
Eggs	0.01	0.05	None

Next Steps

The PMRA invites the public to submit written comments on the proposed MRLs for bifenthrin up to 75 days from the date of publication of this document. Please forward your comments to Publications (see the contact information on the cover page of this document). The PMRA will consider all comments received before making a final decision on the proposed MRLs. Comments received will be addressed in a separate document linked to this PMRL. The established MRLs will be legally in effect as of the date that they are entered into the Maximum Residue Limit Database.

Appendix I

Summary of Field Trial Data Used to Support the Proposed MRLs

Residue data from field trials conducted in Canada and the United States were submitted to support the domestic use of Capture 240 EC on raspberries and potatoes. Residue data for bifenthrin in various crops were submitted to support the maximum residue limits on these imported crops. In addition, processing studies in treated potato, soybean, tomato, pear and tea were reviewed to determine the potential for concentration of residues of bifenthrin into processed commodities.

Maximum Residue Limit(s)

The recommendation for maximum residue limits (MRLs) for bifenthrin was based upon the submitted field trial data, and the guidance provided in the OECD MRL Calculator. Table A1 summarizes the residue data used to calculate the proposed MRLs for various crops.

Table A1 Summary of Field Trial and Processing Data Used to Support Maximum Residue Limit(s) (MRLs)

Commodity	Application Method; Total Application Rate (kg ai/ha)[1]; Formulation	Preharvest Interval (days)	Residues (ppm)		Experimental Processing Factor
			Min	Max	
Carrot	Foliar directed or broadcast; 0.550-0.575; EC & G	20-22	< 0.05	< 0.05	N/A
Garden beet	Foliar; 0.448-0.460; EC & G	1	< 0.05	0.28	N/A
Potato	In-furrow at planting and broadcast foliar; 0.56-0.61; EC & G	21	< 0.05	< 0.05	N/A
Head lettuce with wrapper leaves	Foliar; 0.56-0.67; EC	6-8	< 0.05	1.91	N/A
Spinach	Foliar; 0.448-0.467; EC	36-41	< 0.05	0.16	N/A
Mustard greens	Broadcast foliar; 0.445-0.479; 2EC	6-7	0.05	2.05	N/A
Broccoli	Broadcast or foliar directed spray; 0.560; 2EC	6-7	< 0.05	0.56	N/A
Cauliflower	Broadcast or foliar directed spray; 0.560; 2EC	6-8	< 0.05	0.19	N/A
Cabbage with wrapper leaves	Foliar, 0.560; 2EC	6-7	0.44	3.09	N/A
Soybean	Broadcast foliar; 0.334-0.336; EC	17-18	< 0.05	0.18	1 (refined oil)
Edible podded pea	Foliar; 0.224; EC	3	0.16	0.50	N/A
Succulent shelled pea	Foliar; 0.224; EC	3	< 0.05	< 0.05	N/A
Edible podded bean	Foliar; 0.224; EC	2-4	< 0.05	0.15	N/A
Succulent shelled bean	Foliar; 0.223-0.225; EC	2-4	< 0.05	< 0.05	N/A

Commodity	Application Method; Total Application Rate (kg ai/ha)[1]; Formulation	Preharvest Interval (days)	Residues (ppm)		Experimental Processing Factor
			Min	Max	
Dried shelled pea	Broadcast foliar; 0.224; EC	14-15	< 0.05	< 0.05	N/A
Dried shelled bean	Broadcast foliar; 0.336; EC	13-15	< 0.05	0.10	N/A
Tomato	Broadcast foliar ground spray; 0.347-0.364; EC	0	< 0.05	0.10	0.67 (purée, paste)
		3	< 0.05	0.11	
		4	0.06	0.09	
		5	< 0.05	0.09	
		6	< 0.05	< 0.05	
		7	< 0.05	0.10	
		9	< 0.05	0.05	
Bell Pepper	Foliar spray; 0.223-0.227; EC	6-7	< 0.055	0.24	N/A
Non-Bell Pepper	Foliar spray; 0.168-0.227; EC	6-7	< 0.05	0.31	N/A
Eggplant	Foliar directed spray or broadcast spray; 0.224; EC	7	< 0.05	< 0.05	N/A
Cantaloupe	Broadcast ground or aerial foliar spray; 0.336; EC	3	< 0.10	0.35	N/A
Cucumber	Broadcast ground or aerial foliar spray; 0.336; EC	3	< 0.10	0.24	N/A
Summer squash	Broadcast ground or aerial foliar spray; 0.336; EC	3	< 0.10	0.18	N/A
Pear	Broadcast foliar spray; 0.560-0.673; WP; high and low spray volume	14	0.10	0.56	0.016 (canned pear (peeled); purée (peeled); nectar (peeled)) 0.022 (purée (ground)) 0.017 (nectar (ground))
Mayhaw	Foliar; 0.224-0.227; EC	28-29	0.24	0.78	N/A
Raspberry, blackberry	Foliar directed spray; 0.224; WP or WSP	2-3	<0.05	0.51	N/A
Celery	Foliar directed or broadcast; 0.497-0.566; WP & EC	6-7	0.06	1.26	N/A
Tea (fresh leaves)	Spray; 0.060; EC	7	0.66	5.05	0.94 (dried leaves)

[1] **kg ai/ha = kilograms of active ingredient per hectare**

Based on the dietary burden and residue data, MRLs to cover bifenthrin in livestock matrices are also proposed.

Following the review of all available data, MRLs as proposed in Table 1 are recommended to cover residues of bifenthrin. Residues of bifenthrin in these crop/livestock commodities at the proposed MRLs will not pose an unacceptable risk to any segment of the population, including infants, children, adults and seniors.